

SPECIFICATIONS FOR ABS "S" SERIES SIMPLEX GRINDER PUMP STATIONS

1.0 GENERAL

Furnish and install one (1) simplex pump station to include Sulzer PIRANHA Grinder Pump to deliver the flow and total head ranges defined in the pressure sewer system analysis which is estimated to be 23 GPM at 23' TH. The motors shall be 3520 RPM connected for operation on a 230 volt, 60 HZ, single phase service. The motor shall be an integral part of the pumping unit. The pump discharge size shall be 1-1/4".

The local representative for Sulzer Piranha series of grinder pumps is **Municipal Equipment Company, Inc** (314-290-2999).

The grinder unit shall be capable of shearing and reducing to a fine slurry all material normally found in domestic and commercial sewage such as sanitary napkins, disposable diapers, cloth diapers, wash rags, wood, plastic, etc. The slurry shall be capable of freely passing through a 1-1/4" piping system including check and gate valves.

2.0 GRINDER PUMP CONSTRUCTION

The pump shall be of the centrifugal type with the rotating cutter mounted on the pump shaft directly against the impeller. The stationary cutter shall be mounted in an adjustable bottom plate. The bottom plate shall be cast with grooves threading outward from the center opening of the plate to the outer diameter. The impeller shall be a multiple vane centrifugal type. The cutter material shall be similar to an AISI 440C stainless steel with the addition of cobalt, vanadium, and molybdenum for superior abrasion resistance and a hardness of 58-62 Rockwell C.

The common pump and motor shaft shall be 420 stainless steel supported by a heavy duty lower single row ball bearing and an upper sealed single row ball bearing, all models. The cutting elements and impeller shall be designed to keep the overhung load distance to a minimum. All fasteners shall be 304 stainless steel.

Shaft Seals: Each pump shall be equipped with two seals. The lower seal (pump side) shall be of the mechanical type with silicon carbide faces. The upper seal shall be a lip type seal, mounted at a slight angle to the shaft.

Seal Failure Warning System: The seals shall be separated by an oil chamber. An electronic probe shall be provided in the oil chamber to detect the leakage of water. Solid-state device mounted in the pump control panel or in a separate enclosure shall send a low voltage, low amperage signal to the probe. If water enters the oil chamber, the probe shall activate a warning light in the control panel.

MOTOR CONSTRUCTION

The motor shall be of the submersible type rated per the analysis. The full load current shall not exceed 16 Amps at 230 volts. Motor speeds above 3600 RPM shall not be acceptable.

The motor shall be air filled and shall have Class "F" insulation. The rotor and stator shall be enclosed in a cast iron outer housing. Bimetallic thermal switches shall be imbedded in each phase of the winding to sense high temperature. The rating of the switch shall be 130°C ± 5°C. The control current shall be connected through the bimetallic switches so the motor is shut down should a high temperature condition exist. The switches shall be self-resetting when the motor cools. Power cables shall be rated for an explosion proof environment and have a minimum length of 30'.

3.2 ACCESSORIES

Fiberglass Basin: The pump station wet well shall be glass fiber reinforced polyester basin with a minimum diameter of 30 inches. The resin used shall be a commercial grade unsaturated polyester resin. The reinforcing materials shall be commercial grade "E" type glass in the form of a mat, chopped roving or roving fabric, having a coupling agent that will provide a suitable bond between the glass reinforcement and the resin. Fillers of any type shall not be utilized.

The exterior surface shall be relatively smooth with no sharp projections. Handwork finish shall be utilized to ensure that enough resin is present to eliminate exposed fibers. The exterior surface shall be free of delamination, exposed fibers and blisters larger than 0.5 inches in diameter. The interior surface shall be resin rich with no exposed fibers. The surface shall be free of crazing, delamination, blisters, and wrinkles larger than 0.125 inches or greater in depth.

The wall and bottom laminates shall have a glass content of 30%± 5% glass content by weight and resin content of 70% ± 5%. The basin shall have a pipe stiffness of 2.01 (ASTM D3753, 1984). The flexural modulus in the hoop and axial direction shall be a minimum of 800000 psi. The basin thickness shall be adequate to maintain structural integrity when installed in the conditions listed: 1) Soil modulus of 700 psi, 2) Soil density of 120 pounds per square foot and 3) Lusher's safety factor of 2.

The fiberglass basin depth shall be of the size shown on the plans and shall be equipped with an anti-floatation ring on the bottom but shall not be less than 8" deep. The fiberglass basin shall be furnished with cast iron inlet hub(s) or rubber grommets of the size and number shown on the plans. These shall be furnished loose for field installation. Internal piping and guide rail system shall be factory installed.

The basin shall be equipped with a 1 1/4" NPT coupling for the discharge connection and one (1) 1 1/2" NPT for the electrical connection. These couplings shall be factory installed.

Guide Rail Base and Piping: A cast iron guide rail base shall be mounted on the floor of the pump station. The grinder pump shall be guided onto the cast iron discharge base by a single guide rail supported at the top by an upper guide bracket and at the bottom by the discharge base. The pump base shall be equipped with a straightening vane, which properly aligns the pump on the discharge base just prior to the final seating. The pump slide bracket shall include a fully ported ball check valve. The pump and check valve shall be removable from the guide rail base as a single unit. When the pump is in position, the weight of the pump shall compress the gasket and seal the connection. The area under the pump shall be free and clear of any additional support legs or guides pipes to insure free entrance of solids to the impeller.

The pump guide rail shall be schedule 40 stainless steel pipe and shall be threaded into the pump base. The discharge pipe shall be schedule 80 PVC and 1 1/4" diameter. A bronze 1 1/4" gate valve shall be installed for each pump discharge line. A second gate valve shall be installed in the common discharge line exiting the station and this valve shall be used as a throttling valve to induce head against the pumps. Both gate valves shall have a stainless steel extension handle that will extend from the top of the valve to 1 foot below the top of the basin.

A 1 1/2" anti-siphon valve shall be installed in the basin.

Lifting Chains: Pump lifting chains shall be sized and provided by the pump manufacturer. The chain shall be sized to accommodate the installed pump weight and shall be type 304 or 316 stainless steel. The chain length shall be five feet greater than the station depth.

Float Switches: Float switches shall be Anchor Scientific Roto-Float type SM or approved equal. Each float shall contain a single pole mercury switch, which activates when the longitudinal axis of the float is horizontal, and dictates when liquid level falls 1" below the actuation elevation. The casing shall be chemical resistant polypropylene and have an internal stabilizing weight. A PVC type STO, 2-#18 AWG conductor cable shall protrude from one end of casing. One end of the cable is permanently connected to the glass enclosed mercury switch and the entire assembly is encapsulated to form a completely watertight and impact resistant unit. The electrical cable shall have a minimum length of 30'.

Basin Cover: The basin cover shall be constructed of fiberglass, capable of withstanding 150 pounds per square foot loading, and be of one piece construction. The basin cover shall be bolted to the basin with stainless steel hardware. The basin cover shall include a 2" mushroom vent.

Float Switches: Float switches shall be Anchor Scientific Roto-Float type SM or approved equal. Each float shall contain a single pole mercury switch that activates when the longitudinal axis of the float is horizontal, and dictates when liquid level falls 1" below the actuation elevation. The casing shall be chemical resistant polypropylene and have an internal stabilizing weight. A PVC type STO, 2-#18 AWG conductor cable shall protrude from one end of casing. One end of the cable is

permanently connected to the glass enclosed mercury switch and the entire assembly is encapsulated to form a completely watertight and impact resistant unit. The electrical cable shall have a minimum length of 30'.

Junction Box: An simplex junction box shall be installed in the fiberglass basin. The junction box shall be NEMA 4X, and constructed of Noryl. The junction box shall come complete with two pump power cable glands, four float switch glands, gasketed cover, and stainless steel screws. The junction box shall have a 1 1/2" extension fitting to attach to the electrical control hub. A stainless steel float switch mounting bracket shall be installed next to the junction box.

SIMPLEX CONTROL PANEL

The control panel shall be equivalent to the QC III series of controls offered by Sulzer/ABS Pumps or StaCon housed in a Nema 4X fiberglass enclosure and to include:

- Circuit breaker with short circuit protection, per pump
- Contactor and overload relay, per pump (overload relay provides class 10 trip)
- Start & run capacitors, start relay, per pump
- Hand, Off, Auto selector switch, per pump
- Green pump run light, per pump
- Red seal fail light, per pump
- Switches and lights mounted on elevation bracket. No dead front door included.
- Motor thermal wired into control logic to shut off pump upon an over temp. Pump will restart after thermal cools.
- High water alarm beacon, top mounted on panel
- Highwater alarm buzzer, 95 db @ 2 ft., bottom mounted
- Alarm Off-Auto selector switch
- Terminal blocks for power, pump, and float switch connections.
- Dry Contacts for pump fail, high water, and power failure alarms
- UL approved

Operation: Basic operation of the pumps will be as a pump-down, lead/lag, common "off" system with high level alarm. Where two "off" floats are required by the plans, they shall be set at the same elevation and connected in series. Each pump motor shall be controlled through a Hand-Off-Auto switch. In the Auto position, the pump shall be controlled by the "off" and "on" float-type level sensors in the wet well. Elevations for float switches shall be as shown on the plans. "Off" floats shall not be set lower than the cable entrance into the pump motor.

Pump Station Alarms: Upon a pump seal alarm, a door mounted red pilot light shall illuminate, indicating that the pump will need to be serviced. Upon a pump overload or overtemp the pump will be shut off and will restart after the overload relay is reset. Thermal switches in the motor shall automatically reset.

A cellular monitoring system shall be provided. The unit shall be a High Tide Technologies HTT 900. The system shall monitor incoming power, high water level, low water level, pump 1 run, pump 1 fail, pump starts, and pump run times.

5.0 PRODUCT DATA AND SERVICE REQUIREMENTS

Manufacturer of Major Equipment

These specifications describe certain manufacturers of the required equipment. This is not done, however, to eliminate others equally as good and efficient. Any substitution of equipment or materials will be considered for one reason only; that the equipment proposed for substitution is superior or equal in construction and/or efficiency to that described in the specifications and work space equal to or greater than shown on the drawings is provided, and that high quality has been demonstrated by at least five years of service in similar installations.

If, prior to the opening of bids, the engineer's approval is obtained for alternate equipment, the contractor shall, at his own

expense, make any changes in the structures, building, piping or electrical necessary to accommodate the equipment and if engineering is required due to substitution of other material, the contractor shall pay the engineer for the engineering service.

It will be assumed that the cost to the contractor of the equipment proposed to be substituted is less than the specified equipment and if the substitution is approved, the contractor's bid price shall be reduced by an amount equal to the net savings.

Substitution of equipment other than that specified and shows will not be considered after the opening of bids.

Submittal Data Requirements

The contractor shall submit, as a minimum, the following data for review and approval by the engineer.

- A. Pump performance curves and tests procedures.
- B. Complete technical data showing materials of construction, moments of inertia, weight, type, and length of cable.
- C. Complete motor data including input kW, shaft BHP, full load amps, locked rotor amps, NEMA code letter, motor efficiency, power factor, and moment of inertia.
- D. Dimensional prints.
- E. Details on accessories being supplied.
- F. Installation guides.
- G. Technical manuals.
- H. Parts list(s).
- I. A full set of shop drawings detailing the control system layout. The system layout shall include all mechanical, electrical, ladder diagrams, and panel details to completely describe the system and system operation. Product data and dimension sheets for all control system components.

Operation and Maintenance Manuals

Prior to final acceptance of the control system, four (4) complete system manual with operation and maintenance manuals for all the equipment provided, control system as-built drawings, and parts list shall be provided prior to final acceptance.

6.0 FIELD SERVICE REQUIREMENTS

The control system manufacturer shall maintain a spare parts inventory for the controls within 300 miles of the project location. In addition, the control system manufacturer shall have on staff factory trained field service personnel available within 200 miles.

The pump manufacturer shall maintain spare parts inventory and have a warranty service center within 200 miles of the project location.

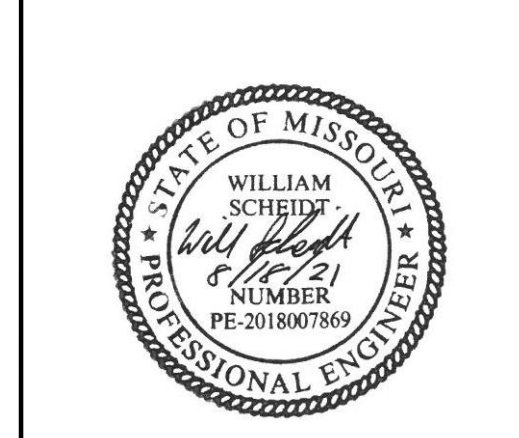
If requested by the engineer, the pump station equipment supplier and/or the control system manufacturer shall supply at least five (5) names, locations and telephone numbers of references. These references would be used to document the service capabilities and quality of field service personnel.

SCOOTER'S COFFEE
 A TRACT OF LAND BEING PART OF SECTION 4
 TOWNSHIP 46 NORTH, RANGE 3 EAST, RANGE 3 EAST,
 CITY OF FALLON,
 ST. CHARLES COUNTY, MISSOURI
IMPROVEMENT PLANS
 PIS PROJECT NO. 9234-SIBRE-00

St. Peters
 22 Richmond Center Court
 St. Peters, MO 63376
 Phone (636) 957-1211
 Fax (636) 937-1104
 www.pis3.com

Pickett Ray & Silver
 Civil Engineering
 & Land Surveying
 Beyond Standard

ENGINEERS AUTHENTICATION
 The responsibility for professional engineering liability on this project is hereby limited to the set of plans authorized by the seal, signature, and date hereunder attached. Responsibility is obtained for all other engineering plans involved in this project and specifically includes revisions after this date unless noted/indicated.
 PICKETT, RAY & SILVER, INC



WILLIAM SCHEIDT, P.E.
 PE-2018007869

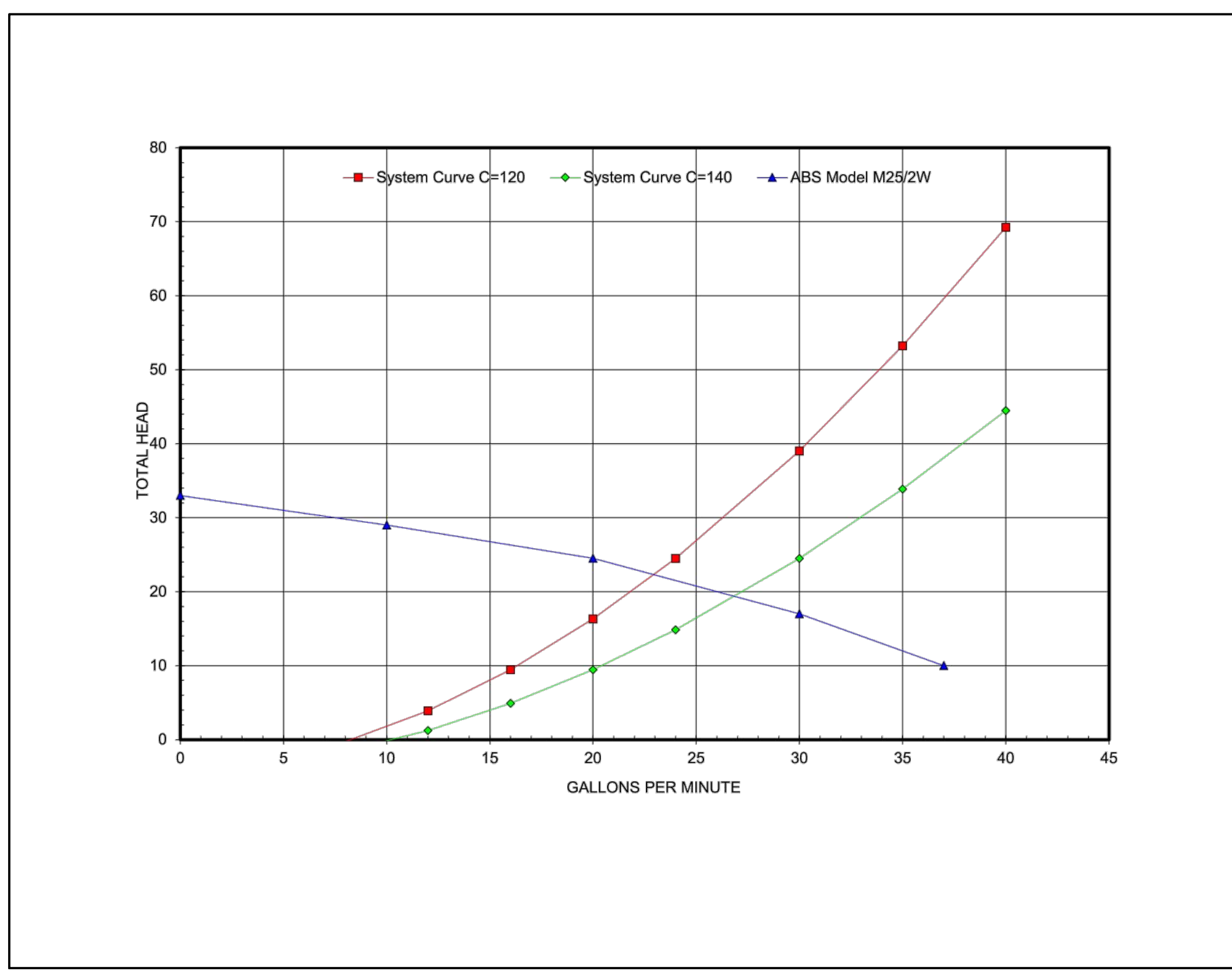
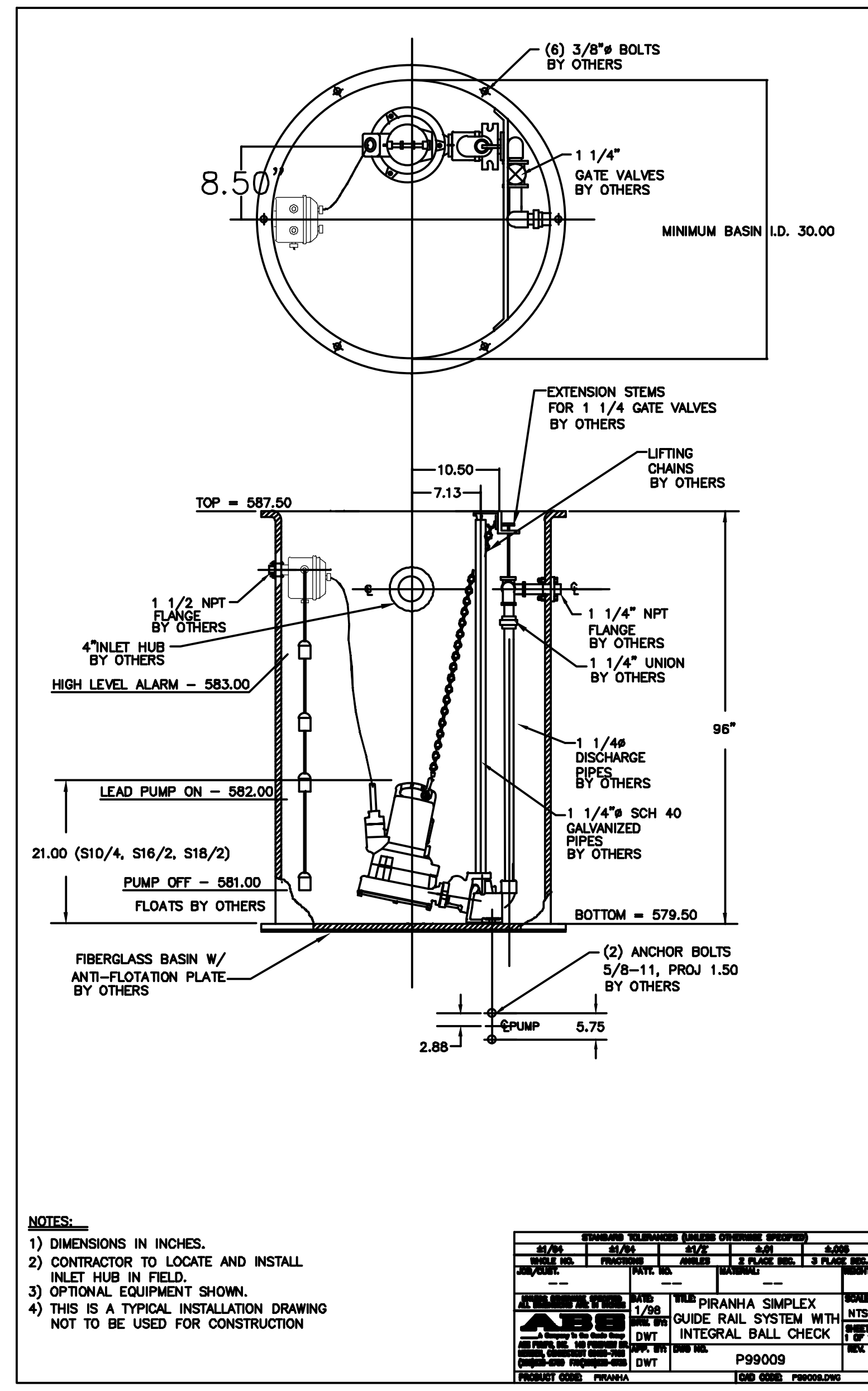
Owner Information:
 Serenity Bean 2, LLC
 1713 NE Lashbrook Drive
 Lee's Summit, MO 64086

City of O'Fallon Improvement Plans

P+Z No.: 21-000022
 Approval Date: 5/6/2021
 City No.: 21-002782

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*** 2021/08/18 IMPROVEMENT PLANS REVIEW ***



- NOTES:**
- 1) DIMENSIONS IN INCHES.
 - 2) CONTRACTOR TO LOCATE AND INSTALL INLET HUB IN FIELD.
 - 3) OPTIONAL EQUIPMENT SHOWN.
 - 4) THIS IS A TYPICAL INSTALLATION DRAWING NOT TO BE USED FOR CONSTRUCTION

DATE	DESCRIPTION	BY	CHKD
05/06/2021	ISSUED FOR PERMITS	W.S.	W.S.
05/06/2021	ISSUED FOR CONSTRUCTION	W.S.	W.S.
05/06/2021	ISSUED FOR CONSTRUCTION	W.S.	W.S.
05/06/2021	ISSUED FOR CONSTRUCTION	W.S.	W.S.
05/06/2021	ISSUED FOR CONSTRUCTION	W.S.	W.S.

PROJECT CODE: PIRANHA
 DRAWING NO.: P99009
 SHEET NO.: 06 OF 11

P: 95234 SCOOTERS COFFEE SITE (3-11-2021) (DWG) (OUTPUT) (IMPROVEMENT PLANS) (06 GRINDER PUMP STATION)